

Claims

What is claimed is:

Claim 1

- 1 1. A method for allowing a request that is any of multiple types to gain access to
- 2 any of multiple resources, comprising:
- 3 a.) defining one or more thresholds, each representing a respective
- 4 predetermined number of the resources;
- 5 b.) associating each threshold with one or more of the types;
- 6 c.) receiving a request; and
- 7 d.) determining, for each threshold associated with the type of the request,
- 8 whether fewer than the predetermined number of resources represented by the
- 9 threshold are each handling a request of any associated type, and if so, allowing the
- 10 request to gain access to any one of the resources that is not handling a request.

Claim 2

- 1 2. The method of Claim 1, and further including determining that the request must
- 2 be retried if each of the predetermined number of resources represented by each
- 3 threshold that is associated with the type of the request is already handling a request.

Claim 3

- 1 3. The method of Claim 2, and further including tracking a requester that issued the
- 2 request after a determination is made that the request must be retried.

Claim 4

- 1 4. The method of Claim 3, and further including:
2 receiving a request from a tracked requester; and
3 allowing the request from the tracked requester to gain access to any one of the
4 resources even if each of the thresholds associated with the type of the request received
5 from the tracked requester has been reached.

Claim 5

- 1 5. The method of Claim 4, and further including discontinuing tracking of a tracked
2 requester after a request from the tracked requester is allowed to gain access to any
3 available one of the resources.

Claim 6

- 1 6. The method of Claim 4, and further including:
2 creating a partition that includes one or more requesters issuing requests to the
3 multiple resources; and
4 allowing the request from the tracked requester to gain access to any one of the
5 multiple resources only if the tracked requester is one of the one or more requesters
6 included in the partition.

Claim 7

- 1 7. The method of Claim 6, wherein the one or more predetermined types include
2 read requests.

Claim 8

- 1 8. The method of Claim 4 wherein multiple requesters are being tracked, and
2 further including utilizing a predetermined priority scheme to select a request from one of
3 the multiple tracked requesters to gain access to any one of the multiple resources that
4 is not handling a request.

Claim 9

- 1 9. The method of Claim 2, wherein a determination that the request must be retried
2 is only made if the request is any of one or more predetermined types.

Claim 10

- 1 10. The method of Claim 2, and further including allowing the request to gain access
2 to any available one of the multiple resources for purposes of causing the request to be
3 retried.

Claim 11

- 1 11. The method of Claim 1, wherein step a.) is performed programmably.

Claim 12

- 1 12. The method of Claim 1, where step b.) is performed programmably.

Claim 13

- 1 13. The method of Claim 1, wherein at least one of the thresholds is associated with
2 a subset of the request types that are associated with a different one of the thresholds.

Claim 14

1 14. A method of processing requests issued to a shared resource by multiple
2 requesters within a data processing system, wherein each request is any one of multiple
3 types, the method comprising:
4 a.) defining one or more thresholds, each threshold being associated with one or
5 more of the types, each threshold indicating the maximum number of requests of any of
6 the associated types that may be pending simultaneously to the shared resource;
7 b.) receiving a request; and
8 c.) determining, for each threshold associated with the type of the request,
9 whether the maximum number of requests indicated by the threshold has been reached,
10 and if not, initiating processing on the request.

Claim 15

1 15. The method of Claim 14, wherein step a.) includes programmably selecting the
2 one or more thresholds.

Claim 16

1 16. The method of Claim 15, wherein step a.) includes programmably associating
2 each of the thresholds with the one or more types.

Claim 17

- 1 17. The method of Claim 14, and further including providing an indication to retry the
2 request if the maximum number indicated by each threshold associated with the type of
3 the request has been reached.

Claim 18

- 1 18. The method of Claim 17, and further including performing the providing step only
2 for predetermined types.

Claim 19

- 1 19. The method of Claim 17, and further including:
2 selecting a requester that has been provided an indication to retry a request;
3 receiving an additional request from the selected requester; and
4 initiating processing of the additional request even if, for each threshold
5 associated with the type of the additional request, the maximum number indicated by the
6 threshold has been reached.

Claim 20

- 1 20. The method of Claim 19, wherein the selecting step is performed using a
2 rotational priority scheme applied to all requesters that have received an indication to
3 retry a request and which have not subsequently issued a request for which processing
4 was completed.

Claim 21

- 1 21. The method of Claim 14, wherein the request types are selected from the group
2 consisting of read requests, write requests, retry requests, and high-priority read
3 requests.

Claim 22

- 1 22. The method of Claim 14, and further including:
2 associating a first threshold with all request types;
3 associating a second threshold with a first sub-set of all request type;
4 associating a third threshold with a sub-set of the first sub-set; and
5 wherein the first threshold is indicative of a number that is less than the number
6 indicated by the second threshold, which is less than the number indicated by the third
7 threshold.

Claim 23

- 1 23. The method of Claim 14, and further including providing an indication to
2 requesters to stop issuing requests if all of the one or more thresholds have been
3 reached.

Claim 24

- 1 24. A system for controlling the manner in which requests are provided to a shared
2 resource, comprising:
3 one or more storage devices, each to store a respective threshold value that is
4 associated with one or more types of requests, each threshold value indicating a
5 cumulative number of requests of the associated types that may gain access to the
6 shared resource at any given time before the threshold value is reached;

load control logic coupled to each of the storage devices to receive requests, and
to allow each request to gain access to the shared resource if the type of the request is
associated with a threshold value that has not yet been reached; and
live-lock logic coupled to the load control logic to selectively elevate the status of
a request that is of a type associated with one or more thresholds values that have been
reached, thereby allowing the request to gain expedited access to the shared resource.

Claim 25

25. The system of Claim 24, wherein the load control logic includes retry logic to
provide an indication that a request must be retried at a later time if all threshold values
associated with the type of the request have been reached.

Claim 26

26. The system of Claim 25, wherein the live-lock logic includes:
a retry storage device to track each requester that issued a request for which a
retry indication was provided; and
priority logic coupled to the storage device to select a requester that is being
tracked; and
logic coupled to the retry storage device to provide elevated status for a request
issued by a selected requester, whereby the request is allowed to gain access to the
shared resource even if all threshold values that are associated with the type of the
request have been reached.

Claim 27

27. The system of Claim 26, wherein one of the one or more storage devices stores
a threshold value associated with requests having an elevated status.

Claim 28

- 1 28. The system of Claim 26, wherein the priority logic includes circuits to implement
2 a rotational priority scheme.

Claim 29

- 1 29. The system of Claim 24, and further including one or more second storage
2 devices coupled to the load control logic, each respectively associated with one of the
3 one or more storage devices, each to store an indication of the one or more request
4 types that are associated with the threshold value stored by the respectively associated
5 one of the one or more storage devices.

Claim 30

- 1 30. The system of Claim 29, and further including a programming interface coupled
2 to the one or more storage devices and the second one or more storage devices to
3 programmably select the stored threshold values and the stored indications of the one or
4 more request types.

Claim 31

- 1 31. A system for controlling the manner in which requests of any of one or more
2 request types access multiple resources, comprising:
3 threshold means for storing one or more threshold values, each threshold value
4 for being associated with one or more of the request types, each threshold value for
5 specifying a cumulative maximum number of requests of associated request types that
6 may gain access simultaneously to any of the resources; and

7 load control means for receiving a request and for determining whether the
8 request is of a type associated with one or more threshold values for which the specified
9 cumulative maximum number of requests has not yet gained simultaneous access to the
10 multiple resources, and if so, for allowing the request to gain access to any available one
11 of the multiple resources.

Claim 32

1 32. The system of Claim 31, and further including live-lock means for elevating the
2 status of the request to allow the request to gain access to any available one of the
3 multiple resources regardless of whether the request is of a type associated only with
4 threshold values for which the specified cumulative maximum number of requests has
5 gained simultaneous access to the multiple resources.